

NorCal Engineering
Soils and Geotechnical Consultants
10641 Humbolt Street Los Alamitos, CA 90720
(562)799-9469 FAX (562)799-9459

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April 10, 1998

Project Number 5936-96

Boeing Realty Company
4060 Lakewood Boulevard, 6th Floor
Long Beach, California 90808-1700

Attn: Mr. Steve Bisset

RE: Grading Recommendations - Proposed Parking Areas - Located
westerly Proposed Harborage Way, Southerly of 190th Street, in
the City of Los Angeles, California

Dear Mr. Bisset:

Pursuant to your request, grading recommendations are being provided for parking areas along the proposed Harborage Way. These recommendations are based upon boring information from our previous report dated March 18, 1996, and recent field observations.

Soil Conditions

The site soils are comprised of fill and native materials. Fill soils generally range from 6 to 16 inches in depth, however localized areas of deeper fills can be expected to be encountered during grading operations.

Fill soils consist of soft to stiff silty CLAYS and clayey SILTS with occasional gravel and other minor debris. Some of these soils are currently moist to wet due to recent seasonal precipitation. Upper native soils also consist of silty clays and clayey SILTS and were observed to be stiff and moist to very moist in some areas.

Grading Recommendations

It is recommended that site inspections be performed by a representative of this firm during future grading and construction of the development to verify the findings and recommendations documented in this and previous reports. Any unusual conditions which may encountered in the course of the project development may require the need for additional study and revised recommendations.

Any vegetation and demolition debris shall be removed and hauled from proposed grading areas prior to the start of grading operations. Any removed soils may be utilized as compacted fill once any deleterious material or oversized materials (in excess of eight inches) is removed. Any existing pavement may be crushed and incorporated into fill soils as recommended by the on-site soils engineering representative. All grading operations shall be performed in accordance with the attached "Specifications for Compacted Fill Operations".

All upper fill soils (approximately 6 to 16 inches) shall be removed to competent native soils, the exposed surface scarified to a depth of 12 inches, brought to the proper moisture content and compacted to a minimum of 90% of the laboratory standard (ASTM: D-1557-78) prior to placement of any additional compacted fill soils, slabs-on-grade and pavement.

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It is likely that isolated areas of undiscovered fill not described in this report are present on site. If found, these areas should be treated as discussed earlier. A diligent search shall also be conducted during grading operations in an effort to uncover any underground structures, irrigation or utility lines. If encountered, these structures and lines shall be either removed or properly abandoned prior to the proposed construction.

Care should be taken to provide or maintain adequate lateral support for all adjacent improvements and structures at all times during the demolition and grading operations and construction phase. Adequate drainage away from the structures, pavement and slopes should be provided at all times.

Temporary Excavations

Temporary unsurcharged excavations in the existing site materials may be made at vertical inclinations up to 4 feet in height and then may be trimmed at a 1 to 1 (horizontal to vertical) gradient up to a maximum height of 10 feet. Cuts in excess of 10 feet must be assessed by this firm prior to excavation procedures. In areas where soils with little or no binder are encountered, where adverse geological conditions are exposed, or where excavations are adjacent to existing structures, shoring, slot-cutting, or flatter excavations may be required. The temporary cut slope gradients given above do not preclude local raveling and sloughing. All excavations shall be made in accordance with the requirements of CAL-OSHA and other public agencies having jurisdiction.

Pavement Design

Pavement design of parking areas should be based upon R-Value testing of subgrade soils near the conclusion of grading operations.

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Closure

The recommendations and conclusions contained in this report are based upon the soil conditions uncovered in our test excavations. No warranty of the soil condition between our excavations is implied. NorCal Engineering should be notified for possible further recommendations if unexpected to unfavorable conditions are encountered during construction phase. It is the responsibility of the owner to ensure that all information within this report is submitted to the Architect and appropriate Engineers for the project.

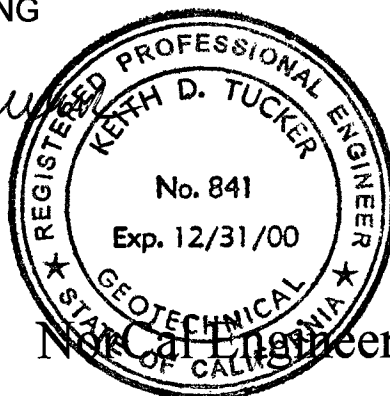
This firm should have the opportunity to review the final plans to verify that all our recommendation are incorporated. This report and all conclusions are subject to the review of the controlling authorities for the project.

A preconstruction conference should be held between the developer, general contractor, grading contractor, city inspector, architect, and soil engineer to clarify any questions relating to the grading operations and subsequent construction. Our representative should be present during the grading operations and construction phase to certify that such recommendations are complied within the field.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully Submitted,
NORCAL ENGINEERING

Keith D. Tucker
Keith D. Tucker
Project Engineer
R.G.E. 841



Mark A. Burkholder
Mark A. Burkholder
Project Manager

SPECIFICATIONS FOR PLACEMENT OF COMPACTED FILL

Preparation

Any existing low density soils and/or saturated soils shall be removed to competent natural soil under the inspection of the Soils Engineering Firm. After the exposed surface has been cleansed of debris and/or vegetation, it shall be scarified until it is uniform in consistency, brought to the proper moisture content and compacted to a minimum of 90% relative compaction (in accordance with ASTM: D-1557-78).

Material For Fill

The on-site soils or approved import soils may be utilized for the compacted fill provided they are free of any deleterious materials and shall not contain any rocks, brick, asphaltic concrete, concrete or other hard materials greater than eight inches in maximum dimensions. Any import soil must be approved by the Soils Engineering firm a minimum of 24 hours prior to importation of site.

Placement of Compacted Fill Soils

The approved fill soils shall be placed in layers not excess of six inches in thickness. Each lift shall be uniform in thickness and thoroughly blended. The fill soils shall be brought to within 15% of the optimum moisture content, unless otherwise specified by the Soils Engineering firm. Each lift shall be compacted to a minimum of 90% relative compaction (in accordance with ASTM: D-1557-78) and approved prior to the placement of the next layer of soil. Compaction tests shall be obtained at the discretion of the Soils Engineering firm but to a minimum of one test for every 500 cubic yards placed and/or for every 2 feet of compacted fill placed.

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The minimum relative compaction shall be obtained in accordance with accepted methods in the construction industry. The final grade of the structural areas shall be in a dense and smooth condition prior to placement of slabs-on-grade or pavement areas. No fill soils shall be placed, spread or compacted during unfavorable weather conditions. When the grading is interrupted by heavy rains, compaction operations shall not be resumed until approved by the Soils Engineering firm.

Grading Observations

The controlling governmental agencies should be notified prior to commencement of any grading operations. This firm recommends that the grading operations be conducted under the observation of a Soils Engineering firm as deemed necessary. A 24 hour notice must be provided to this firm prior to the time of our initial inspection.

Observation shall include the clearing and grubbing operations to assure that all unsuitable materials have been properly removed; approve the exposed subgrade in areas to receive fill and in areas where excavation has resulted in the desired finished grade and designate areas of overexcavation; and perform field compaction tests to determine relative compaction achieved during fill placement. In addition, all foundation excavations shall be observed by the Soils Engineering firm to confirm that appropriate bearing materials are present at the design grades and recommend any modifications to construct footings.

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